

UNDER

The Resource Management Act 1991

IN THE MATTER

of the Proposed Otago Regional Policy
Statement 2021

STATEMENT OF EVIDENCE OF KELVIN MICHAEL LLOYD

Dated 8 September 2023

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Qualifications and Experience

1. I hold the degrees of Bachelor of Science with First Class Honours (1996), and Doctorate of Philosophy (2000), both obtained from the University of Otago, where my studies were undertaken at the Department of Botany. Subsequent to University study I was awarded a three-year Post-Doctoral Fellowship from the Foundation for Research, Science and Technology, during which I was employed by Landcare Research Ltd in Dunedin. I have been employed by Wildland Consultants Ltd from 2004 to the present, based in Dunedin, and my current position is Senior Principal Ecologist.
2. I am an author of 22 scientific papers published in peer-reviewed national and international scientific journals, as well as several popular articles. I have also presented aspects of my research at national and international scientific conferences. I have lectured in plant ecology at 3rd year level at the University of Otago. I remain an honorary research associate of Landcare Research Ltd and continue to publish research papers in collaboration with other scientists as time permits. I am a member of the New Zealand Ecological Society, the New Zealand Botanical Society, the Ornithological Society of New Zealand, the New Zealand Biosecurity Institute, the New Zealand Native Forest Restoration Trust and the New Zealand Plant Conservation Network.
3. I have worked as an ecological consultant for almost 20 years based in Otago Region, and have an excellent understanding of indigenous biodiversity patterns across Otago. In 2017 I wrote a report identifying strategic options to improve management of indigenous biodiversity in Otago¹. In 2020 I mapped potential natural ecosystems across Otago², and led a project that mapped important habitats for indigenous fauna

¹ Wildland Consultants 2017: Strategic analysis of options to improve management of ecosystems and biodiversity for Otago Region. *Wildland Consultants Ltd. Contract Report No. 4262*. Prepared for Otago Regional Council.

² Wildland Consultants 2020: Mapping of potential natural ecosystems and current ecosystems in Otago Region. *Wildland Consultants Contract Report No. 5015a*. Prepared for Otago Regional Council.

across the region³. In 2021 I compiled a report on the state of indigenous biodiversity in Otago Region⁴.

4. I compiled previous evidence and reports on ecological aspects of the Proposed Otago Regional Policy Statement (PORPS). This work included evaluation of submissions on the APP2-APP4 criteria for ecological significance, biodiversity offsetting, and biodiversity compensation⁵. I also compiled reports and evidence on aspects of the ECO policies in the PORPS⁶.
5. I prepared and presented Environment Court evidence on PORPS policy in 2017, specifically commenting on the biodiversity offsetting and biodiversity compensation policies at that stage⁷. I also prepared rebuttal evidence and supplementary evidence for this hearing. I did a further evaluation of submissions and evidence, part of which focussed specifically on the merits of the ecological significance criteria in PORPS APP2 compared with those in the draft National Policy Statement for Indigenous Biodiversity (NPS-IB)⁸.
6. I have helped to develop numerous ecological significance criteria sets, including significance criteria sets for the Otago RPS, Canterbury RPS, Auckland Unitary Plan, West Coast Land and Riverbed Management Plan, Dunedin City Council, and Buller District Council. I was one of the experts that recently evaluated the PORPS APP2 ecological significance criteria⁹.
7. I have undertaken numerous ecological significance assessments in Dunedin District and Waitaki District, as part of district-wide SNA identification processes.

³ Wildland Consultants 2020: Mapping of significant habitats for indigenous fauna in terrestrial, freshwater, and marine ecosystems in Otago Region. *Wildland Consultants Contract Report No. 5015b*. Prepared for Otago Regional Council.

⁴ Wildland Consultants 2021: An overview of the state of indigenous biodiversity in the Otago Region. *Wildland Consultants Contract Report No. 5704a*. Prepared for Otago Regional Council.

⁵ Wildland Consultants 2022: Ecological advice on biodiversity criteria in the Otago Regional Policy Statement. *Wildland Consultants Ltd Contract Report No. 6299*. Prepared for Otago Regional Council.

⁶ Wildland Consultants 2021: Ecological advice on indigenous biodiversity provisions in the Proposed Otago Regional Policy Statement. *Wildland Consultants Ltd Contract Report No. 5704*. Prepared for Otago Regional Council.

⁷ Statement of evidence of Kelvin Michael Lloyd dated 27 October 2017. ENV-2016-CHC-103.

⁸ Wildland Consultants 2023: Evaluation of biodiversity submissions on the Proposed Otago Regional Policy Statement. *Wildland Consultants Ltd Contract Report No. 6299a*. Prepared for Otago Regional Council.

⁹ Joint witness statement – ecologists, dated 31 March 2023.

8. I also have considerable experience in biodiversity offsetting, having led several Wildlands projects, contracted by the Department of Conservation, to assess the utility of biodiversity offsetting in New Zealand. This included investigation of options for generation of biodiversity credits¹⁰, developing a case study biodiversity offsetting approach for the proposed Escarpment Mine¹¹, assessing the selection and weighting of biodiversity offsetting attributes¹², and comparing and contrasting the results of three offsetting pilot projects¹³. I routinely provide technical advice to other Wildlands staff on the design of robust biodiversity offsetting approaches.
9. My work as an ecological consultant has covered a wide range of vegetation types, including wetlands, grasslands, shrublands, forests, and alpine vegetation. This work has included ecological investigations of areas of vegetation throughout New Zealand, including sites in Northland, Auckland, Hawkes Bay, Wairarapa, Horowhenua, Wellington, Chatham Islands, Marlborough, Nelson, Canterbury, Buller, Westland, Otago, and Southland. I am an author of over 330 contract reports covering these assessments and I have prepared expert evidence in 36 Environment Court or similar cases in relation to these projects.

Code of Conduct

10. I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note 2023. I have complied with the code in preparing my evidence. Other than where I state that I am relying on the advice of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

¹⁰ Wildland Consultants 2011: Options for calculation and use of biodiversity credits generated by Yellow-eyed Penguin Trust conservation activities. *Wildland Consultants Contract Report No 2554b*. Prepared for the Department of Conservation. 29 pp.

¹¹ Wildland Consultants 2011: Biodiversity offsetting models for the Escarpment Mine project, Denniston Plateau, Westland. *Wildland Consultants Contract Report No. 2653*. Prepared for the Department of Conservation. 38 pp.

¹² Wildland Consultants 2012: Selection and weighting of attributes for use in biodiversity offsetting currencies. *Wildland Consultants Contract Report No 2946*. Prepared for the Department of Conservation. 23 pp.

¹³ Wildland Consultants 2012: Comparing and contrasting biodiversity offset pilot case studies for the Hunua Quarry, Tahurangi Eco-resort, and the proposed Escarpment Mine. *Wildland Consultants Contract Report No 2857*. Prepared for the Department of Conservation. 48 pp.

Scope of Evidence

11. This statement of evidence focuses on the following:
 - 11.1. Nationally important indigenous biodiversity in Otago.
 - 11.2. Evaluation of ecological significance criteria in the PORPS and NPS-IB.
 - 11.3. Evaluation of offsetting and compensation criteria in the PORPS and NPS-IB.

Nationally important indigenous biodiversity in Otago

12. Otago has many endemic fauna, particularly lizards and fish, and these cannot be protected elsewhere in New Zealand. Otago also has nationally important coastal habitats for marine mammals, penguins, and shag. The more forested parts of Otago are key habitats for threatened birds such as mohua (*Mohoua ochrocephala*), South Island kaka (*Nestor meridionalis meridionalis*), and long-tailed bat (*Chalinolobus tuberculatus*). Otago has national strongholds for naturally uncommon ecosystems, and hotspots for nationally threatened plant species.
13. There are 31 lizard taxa in Otago, more than in any other region of New Zealand, and eight of these are endemic to Otago Region¹⁴ and cannot be managed elsewhere. Otago contains national stronghold populations for 24 of the lizard 31 taxa, and eleven of the 31 taxa are Threatened nationally¹⁴. While the threatened Otago endemic Otago skinks (*Oligosoma otagense*) and grand skink (*Oligosoma grande*) are well known, the Otago lizard assemblage also includes recently discovered taxa such as the hura te ao gecko¹⁵ (*Mokopirirakau galaxias*; Threatened-Nationally Endangered). Only one of the lizard taxa in Otago, McCann's skink (*Oligosoma maccanni*), is classified as nationally Not Threatened.
14. Coastal habitats are particularly important for marine-feeding indigenous fauna in Otago. Yellow-eyed penguin (*Megadyptes antipodes*; Nationally Endangered), southern blue penguin (*Eudyptes minor minor*, At Risk-

¹⁴ Jarvie S., Knox C., Monks J., Reardon J., and Campbell C. 2023: Conservation status of reptile species in Otago. *Otago Threat Classification Series 1*. Otago Regional Council.

¹⁵ Knox C., Hitchmough R.A., Nielsen S.V., Jewell T., and Bell T. 2021: A new, enigmatic species of black-eyed gecko (Reptilia: Diplodactylidae: *Mokopirirakau*) from North Otago, New Zealand. *Zootaxa 4964*: 140-156.

Declining), titi (*Puffinus griseus*; At Risk-Declining), Otago shag (*Leucocarbo chalconotus*; Nationally Increasing), northern royal albatross (*Diomedea sanfordi*; Nationally Vulnerable), New Zealand fur seal (*Arctocephalus forsteri*; Not Threatened), and New Zealand sea lion (*Phocarctos hookeri*; Nationally Vulnerable) all breed in coastal Otago. Taiaroa Head holds the only 'mainland' breeding colony of an albatross anywhere in the world. New Zealand sea lions use a range of coastal habitats at different life cycle stages, for example resting on beaches, giving birth in secluded habitat, and having creche sites where pups can gather.

15. Otago hold a high proportion of New Zealand's naturally uncommon ecosystems. Key naturally uncommon ecosystems in Otago Region are ephemeral wetlands, inland saline ecosystems, inland outwash gravels, and coastal turfs, all of which are Critically Endangered on a national basis¹⁶. Each of these ecosystems provides habitat for nationally Threatened and At Risk plant species.
16. There are 13 coastal turf sites in Otago, and nine of these are located on private land, with only two of these having formal legal protection¹⁷. Competition with exotic pasture species is a key threat to coastal turfs.
17. There are 23 Otago locations of inland saline ecosystems, and Otago is the national stronghold for these. Like coastal turfs, competition with exotic plant species is a key threat to inland saline ecosystems. Inland saline ecosystems are not documented elsewhere in New Zealand (although a single saline lake may be present in the Mackenzie Basin) so Otago has a particular responsibility for managing them.
18. Otago has more ephemeral wetlands than any other region of New Zealand, with over 3,000 mapped¹⁸ in Otago. These wetlands are ranked as Critically Endangered. They too are threatened by invasion of exotic pasture species, but also by cultivation and mining. As many ephemeral wetlands are dominated by improved pasture species, they are exempted

¹⁶ Holdaway R.J., Wiser S.K., and Williams P.A. 2012: Status assessment of New Zealand's naturally uncommon ecosystems. *Conservation Biology* 26: 619-629.

¹⁷ Brownstein G.E., Mason N., and Monks A. 2022: Coastal turfs of Otago: monitoring plan. *Landcare Research Contract Report LC4218*. Prepared for Otago Regional Council.

¹⁸ Wildland Consultants 2020: Mapping of potential natural ecosystems and current ecosystems in Otago Region. *Wildland Consultants Ltd Contract Report No. 5015a*. Prepared for Otago Regional Council.

from inland natural wetland status. Ephemeral wetlands are critical habitats for many Threatened and At Risk plant species.

19. Macraes Ecological District is a national hot spot for nationally Threatened and At Risk plant species, and a national stronghold for the rare grass *Simplicia laxa* (Threatened-Nationally Critical)¹⁹. Otago Region contains habitats for at least 97 nationally Threatened plant species, around 200 ranked as At Risk, and approximately 30 plant species ranked as Data Deficient. There are at least 36 plant species that are endemic to Otago, and 15 of these are Threatened taxa. The process to fully document these species is still underway.
20. Otago retains a considerable amount of indigenous forest, including many examples of coastal podocarp/broadleaved forest in the coastal hills, beech forests in the Catlins, Blue Mountains, and western lakes, and cedar forest on the Dunedin hills, in the Catlins, and in the East Matukituki and Shotover River catchments. The extensive podocarp/broadleaved forests in the Catlins and beech forests in the western lakes provide critical habitat for threatened forest fauna such as long-tailed bat (Threatened-Nationally Critical), mohua (At Risk-Declining), South Island kaka (Threatened-Nationally Vulnerable), and kea (*Nestor notabilis*; Threatened-Nationally Endangered).
21. Otago is also well-represented in wetlands, particularly upland bogs, fens, and seepages, and lowland swamps. The current extent of wetlands in Otago has been estimated at 66% of their historic extent²⁰.
22. Indigenous dryland habitats in the Alexandra, Cromwell, and Wanaka basins have been significantly reduced and modified, but the remnant indigenous dryland ecosystems that remain still provide habitat for some of New Zealand's most threatened plant species, including *Ceratocephala pungens* (Nationally Critical), *Solenogyne christensenii* (Nationally Critical), *Leptinella conjuncta* (Nationally Critical) New Zealand mousetail (*Myosurus minimus*; Nationally Vulnerable), and *Myosotis brevis* (Nationally Vulnerable).

¹⁹ De Lange P.J., Smissen, R.D, Rolfe J.R., and Ogle C.C. 2016: Systematics of *Simplicia* Kirk (Poaceae, Agrostidinae) – an endemic, threatened New Zealand grass genus. *Phytokeys* 75: 119-114.

²⁰ Wildland Consultants 2020: Mapping of potential natural ecosystems and current ecosystems in Otago Region. *Wildland Consultants Ltd Contract Report No. 5015a*. Prepared for Otago Regional Council.

23. This multitude of significant terrestrial and wetland indigenous biodiversity values in Otago Region warrant strong policy direction to protect and maintain them.

Ecological significance criteria

24. The Ecological significance criteria are set out in Appendix 1 of the NPS-IB cover four broad criteria of ecological significance, these being Representativeness, Diversity and Pattern, Rarity and Distinctiveness, and Ecological Context.
25. The NPS-IB specifies that an area qualifies as an SNA if it meets any one of the attributes of the four significance criteria. This raises the attributes above the criteria. It is not clear whether significance could be assessed using the criteria alone.
26. The NPS-IB Appendix 1 supersedes the Joint Witness Statement of the Ecologists on APP2 - Significance criteria for indigenous biodiversity dated 31 March 2023.
27. I understand that the PORPS is directed by the NPS-IB to use the NPS-IB significance criteria.

Ecological context

28. Both the PORPS and NPS-IB criteria sets contain attributes for buffering and connectivity, but the NPS-IB criterion does not capture important indigenous fauna habitats. The PORPS criterion for indigenous fauna habitats is particularly important in an Otago context, providing a basis for the recognition and protection of indigenous fauna habitats across many species groups²¹. The joint witness statement includes the following agreed fauna habitat criterion:

An area that is important for a population of indigenous fauna during a critical part of their life cycle, either seasonally or permanently, e.g. for feeding, resting, nesting, breeding, spawning, or refuges from predation.²²

²¹ Paragraphs 13, 14, and 20 of this evidence.

²² Joint Witness Statement of Ecologists dated 31 March 2023 at page 10

29. This is particularly important criterion in Otago, which has so many endemic or national stronghold populations of indigenous fauna. This criterion should be added in the PORPS as another factor to consider under the NPS-IB ecological context criterion. It does not narrow the NPS-IB criterion, but adds an extra requirement in Otago.

Summary

30. In summary, I recommend that APP2 of the PORPS is replaced with Appendix 1 of the NPSIB, with the addition of the fauna habitat criterion added as an attribute of the ecological context criterion.

Offsetting criteria

31. The NPS-IB sets out eleven biodiversity offsetting principles in Appendix 3, whereas I advised that the PORPS should have thirteen criteria in APP3 and additional stand-alone policies that provide more specificity in terms of limits to offsetting potential adverse effects on vulnerable and irreplaceable indigenous biodiversity²³.
32. There is much common ground between the NPS-IB principles and the suggested APP3 criteria. APP3 does not have criteria matching NPS-IB principles 10, which relates to tangata whenua and stakeholder participation, or 11, which relates to transparency. Stakeholder participation generally results in a more robust offsetting currency, and increases transparency. The NPS-IB criteria are thus better in these respects.
33. The PORPS APP3 offsetting provisions provide stronger direction on constraints around offsetting than the NPS-IB offsetting principles, that would place more explicit limits to offsetting and promote more robust offsetting. The bottom lines in APP3(1) should be retained in the PORPS so they can be evaluated together with the NPS-IB offsetting criteria.

²³ Wildland Consultants 2023: Evaluation of biodiversity submissions on the Proposed Otago Regional Policy Statement. *Wildland Consultants Ltd. Contract Report No. 6299a*. Prepared for Otago Regional Council.

Would the contravention of the bottom lines in in APP3(1) achieve a net gain outcome and maintain indigenous biodiversity?

(a) the loss from an ecological district of Threatened taxa, other than kānuka (*Kunzea robusta* and *Kunzea serotina*), under the New Zealand Threat Classification System (Townsend et al, 2008);

34. If a Threatened taxon was lost from an ecological district this would be difficult to offset or compensate for. It would not maintain indigenous biodiversity, the ecological district would no longer hold a population of that taxon.

(c) the likely worsening of the conservation status of any indigenous biodiversity as listed under the New Zealand Threat Classification System (Townsend et al, 2008);

35. The worsening of the conservation status of any indigenous biodiversity would represent a significant adverse change, and could not be offset or compensated for. An outcome like this would not maintain indigenous biodiversity, because it implies a significant reduction in national range, population size, or decline rate.

(d) the removal or loss of health and resilience of a naturally uncommon ecosystem type that is associated with indigenous vegetation or habitat of indigenous fauna;

36. The removal or loss of health and resilience of a naturally uncommon ecosystem associated with indigenous vegetation or indigenous fauna habitat, would generally be difficult to offset or compensate for, resulting in net loss outcome. Naturally uncommon ecosystems would generally be quite difficult to artificially create, and even more difficult to revegetate. The possible exception is a naturally uncommon ecosystem that provides indigenous fauna habitat, for example if naturally uncommon scree or boulderfield provided habitat for indigenous lizards, it may be possible to artificially create lizard habitat and thus offset or compensate for the loss of habitat. This scenario could potentially result in a net gain and potentially maintain indigenous biodiversity.

(e) the loss (including through cumulative loss) of irreplaceable or vulnerable indigenous biodiversity

37. The loss of irreplaceable or vulnerable indigenous biodiversity could not result in a net gain, and would not maintain indigenous biodiversity.
38. I have advised that biodiversity offsetting in the PORPS should have additional criteria that promote the use of counts and measures and disaggregation of high value biodiversity types in biodiversity offsetting currencies. These additional criteria would also improve transparency and could be added under that principle:
- 38.1. Objective counts and measures should be used wherever possible
- 38.2. All high value species or vegetation types should be included as components.
- 38.3. High value components should be disaggregated, so that no trade-offs between them can occur.
39. I am aware that Clause 3.24 of the NPS-IB sets out information requirements for resource consent applications for activities that would have more than minor adverse effects on indigenous biodiversity, however the additional considerations outlined at 38.1 to 38.3 above would ensure more robust offsetting outcomes. This would make a net gain more likely, and better ensure the maintenance of indigenous biodiversity.
40. Offsetting principles similar to those in the NPS-IB have not prevented the use of poor-quality offsetting currencies. The additional stringency provided by more detailed guidance on offsetting attribute selection, if used in the PORPS, would promote use of more robust offsetting currencies in Otago.

Summary

41. In summary, I recommend that APP3 of the PORPS is replaced with Appendix 3 of the NPSIB, with the following amendments:
- 41.1. The 'bottom lines' in APP3 (1) should be included in the PORPS offsetting policy if this is possible.

- 41.2. The additional criteria I suggest in paragraph 38 should be added to the Appendix 3 NPS-IB criteria. This would promote more robust offsetting and not weaken the NPS-IB criteria.

Compensation criteria

42. There is more difference in the Appendix 4 NPS-IB principles for biodiversity compensation, and the suggested PORPS criteria in APP4. The NPS-IB has principles 3, and 9-13 for scale of biodiversity compensation, trading up, financial contribution, science and matauranga Maori, tangata whenua and stakeholder participation, and transparency. The PORPS lacks equivalent criteria for these six matters. The suggested PORPS compensation criteria for achievability (sub clause (h) of APP4) is a constraint that the NPS-IB principles do not share. The APP4 Achievability clause not present in the NPS-IB should be retained:

Achievability: The biodiversity compensation outcome is demonstrably achievable.

43. By ensuring that only demonstrably achievable compensation outcomes are considered, this lessens the risk of net gain not being achieved, helping to maintain indigenous biodiversity.
44. The PORPS APP4 compensation criteria are generally weaker than the NPS-IB Appendix 4 compensation principles, and the latter would strengthen the PORPS and could replace the current APP4 criteria, except for retention of the Achievability criterion described above.

Would the contravention of the bottom lines in in APP4(1) achieve a net gain outcome and maintain indigenous biodiversity?

45. With the potential exception in paragraph 46 below, the 'bottom lines' in APP4 (1) of the PORPS should be included under clause (2) of the NPS-IB principles, as they are further specific examples of 'vulnerable and irreplaceable' values, as per the NPS-IB compensation principle 2(a).

(a) the loss from an ecological district of an indigenous taxon (excluding freshwater fauna and flora) or of any ecosystem type

46. The first compensation bottom line is that compensation is not available where there is loss from an ecological district of any indigenous taxon, or of any ecosystem type. In the first scenario, it may be possible for an

effect to cause loss of a taxon from an ecological district, yet achieve a net gain offsetting or compensation outcome. This would generally be the case for early successional taxa such as mānuka (*Leptospermum scoparium*) or kānuka, or for species which are routinely propagated and planted, e.g harakeke (flax; *Phormium tenax*). In these instances, indigenous biodiversity would be maintained.

47. If the bottom line was similar to the corresponding one for offsetting, referring to Threatened taxa (other than kānuka), it would be worth retaining, but if referring to all taxa, there are too many scenarios where a net gain and maintenance of indigenous biodiversity could occur, and the bottom line should be removed.

(b) removal or loss of viability of the habitat of a Threatened or At Risk indigenous species of fauna or flora under the New Zealand Threat Classification System (Townsend et al, 2008)

48. Loss of an ecosystem type from an ecological district would generally be difficult to achieve a net gain outcome from, as most ecosystems are hard to create.

(c) removal or loss of viability health and resilience of a naturally rare or naturally uncommon ecosystem type that is associated with indigenous vegetation or habitat of indigenous fauna

49. Removal or loss of viability of the habitat of a Threatened indigenous species of flora or fauna would generally be difficult to achieve a net gain for, and thus would not result in maintenance of indigenous biodiversity.
50. Removal or loss of health and resilience of a naturally uncommon ecosystem that is associated with indigenous vegetation or provides indigenous fauna habitat would generally be difficult to achieve net gain for, but some recreation of some examples of fauna habitat would be possible, and these could achieve a net gain and maintain indigenous biodiversity.

(d) the likely worsening of the conservation status of any Threatened or At Risk indigenous biodiversity listed under the New Zealand Threat Classification System (Townsend et al, 2008)

51. Worsening of the conservation status of any Threatened or At Risk indigenous biodiversity, and the loss of irreplaceable or vulnerable indigenous biodiversity, would generally be difficult to achieve net gain for, and would not maintain indigenous biodiversity,

Summary

52. In summary, I recommend that APP4 of the PORPS is replaced with Appendix 4 of the NPSIB, with the following amendments:

52.1. A criterion for achievability should be added.

52.2. With the potential exception of APP4(1)(a), the 'bottom lines' in APP4(1) should be added to clause (2) of the NPS-IB principles.



Kelvin Michael Lloyd

Dated: 8 September 2023